COLORADO RIVER RECOVERY PROGRAM **RECOVERY PROGRAM**
FY 2006 ANNUAL PROJECT REPORT **PROJECT NUMBER: 129**

1. Project Title: **Humpback chub population estimate in Desolation/Gray Canyon, Green River, Utah.**

II. Principal Investigators:

Patrick Goddard
Utah Division of Wildlife Resources
Moab Field Station
1165 S. Highway 191 - Suite 4
Moab, UT 84532
435-259-3781 Fax: 435-259-3785
Email: patrickgoddard@utah.gov

Paul Badame
Utah Division of Wildlife Resources
Moab Field Station
1165 S. Highway 191 - Suite 4
Moab, UT 84532
435-259-3780 Fax: 435-259-3785
Email: paulbadame@utah.gov

III. Project Summary:

The population of humpback chub in Desolation and Gray canyons (Deso/Gray) is one of the five self-sustaining populations that exist within the upper basin in the Colorado River and Green River sub-basin. This population has been monitored for over 25 years, and the Utah Division of Wildlife Resources has been responsible for the monitoring since 1985. The RIP amended the recovery plan for humpback chub in 2002 and the approved supplement outlined goals that need to be met for downlisitng and delisting to be considered. The recovery goals require that subsequent population estimates for Desolation/Gray Canyon humpback chub be conducted in three out of every five years. This study, which represents the first sampling year in a three-year effort, will meet this direction and help provide for six separate point estimates within an eight-year time period.

IV. Study Schedule:

a. Initial year: 2006
b. Final year: 2008

V. Relationship to RIPRAP:

Green River Action Plan: Mainstem
V.B. Conduct population estimate for humpback chub.
V.B.1. Desolation/Gray

VI. Accomplishments of FY 2006 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

As recommended in the final report from the previous sampling effort in 2001-2003, the sampling was conducted in the fall to avoid the capture of spawning Colorado pikeminnow and to reduce handling stress on humpback chub. Three full sampling passes were conducted through Desolation/Gray canyons on September 26 – October 3, October 6 – October 16, and October 22–29. In addition, a fourth abbreviated trip was conducted November 6 – November 13 to increase recapture rates and improve population estimates. A total of 12 sites were sampled throughout the canyons including the four long-term trend sites at RM 185, 174.4, 160.4, and 145. The other eight sites were located at RM 202, 182,178.5,166.8, 157.4, 154.5, 150 and 147.5. Sampling on the last trip was conducted at every other campsite to spread the effort out evenly throughout the canyon. Flows during sampling in 2006 ranged from 3130–5990 cfs. The flows were 2000-2470 cfs during the first pass, 3330-4810 cfs during the second pass, 3190-3370 cfs during the third pass, and 2670-2580 during the last pass (all flows determined by USGS gage #09315000, Green River at Green River gage). Sampling during the fall is less stressful on captured fish because ambient and water temperatures are low. Average temperatures during each pass were 15.5., 12.7, and 8.6 respectively (no temperatures were recorded on the fourth pass). Two 16' catarafts with either a 25 HP or a 8 HP four strike outboard were used to work trammel nets. Previous monitoring trips have shown that 1" trammel nets are the most effective method for collecting adult sized chubs. Depending on available habitat, six to eight 75' Trammel nets (1" mesh) were set at each sampling location. One night was spent at each of the twelve sites. The nets were fished at each site from late-afternoon until late evening and again the next day during the pre-dawn and morning hours. A half inch inner mesh trammel net was set at various sites in an effort to increase the capture of the juvenile component of the Deso/Gray humpback chub population. In addition, electrofishing and Fyke nets were utilized in an effort to collect juvenile chub. Fyke nets were set in the afternoon after arrival at each site and checked in the late morning prior to leaving. Cat food and cooked meats were used as bait, and the Fyke nets were aligned parallel to the flow. Fyke nets were primarily set from the shoreline. Electrofishing was conducted using a 14' oar-driven raft. One pass of electrofishing was conducted at each of the lower six study sites (both shorelines) as well as between the lower sites (shoreline with best habitat). Electrofishing was conducted primarily on the lower stretches of the canyon (RM 160.4-145.7) because extensive electrofishing had occurred around the upper reach (RM 202 – 166.8) earlier in the summer during non-native fish removal efforts and there was some concern about the exposure to shocking equipment of all native fish species.

A total of 220 individual humpback chub were collected in Desolation/Gray canyons by trammel netting, electrofishing, and fyke netting. Trammel nets yielded the highest catch of humpback chub. Trammel net catch rates were lower during the first two passes and increased during the third and fourth pass. A total of 199 humpback chub were collected in 3289 trammel net hours during the four passes through the canyons, yielding an overall catch rate of .061 fish/net hour (Table 1). Sixteen hours of electrofishing resulted in 12 humpback chub, and fyke net catch rates were low (9 humpback chub in 729.37 hours). Neither method was very effective in catching juvenile chub. Average total length of chubs caught was 273 mm with a range of 195- 392 mm (Figure 1). Four of the humpback chub collected were subadults (< 200 mm TL), all of these were taggable (> 150 mm TL). Average total length of humpback chub caught in trammel nets was 272.6 mm with a range of 196–392 mm. Humpback chub captured in fyke nets averaged a total length of 266 mm (range195 –309 mm). Electroshocking resulted in capturing humpback chub that averaged 287 mm (range 238-349). One chub was collected in a trammel net that was only identified to genus (total length 245), one additional chub (not identified to species because of size) was electroshocked, and its total length was 128 mm.

Several humpback chub that had been captured on the earlier passes were recaptured on subsequent passes. No movement of chub was observed. Long term recaptures (fish PIT tagged in previous years or earlier in 2006 during other RIP projects) were observed during all three trips. Eighty-two total long-term recaptures were captured. A collection of morphometric measurements (ray counts on dorsal and anal fins) was taken on all Gila species. In addition, photographs were taken of most fish, and genetic samples were collected on 50 adult humpback chub.

The results presented in this report are a preliminary summary of the raw data. A population estimate will be generated following further verification and analysis of this data.

Table 1. Summary of chub catch by each method employed in Desolation/Gray canyon during 2006. Note: This table is a total of *Gila* spp. (since fish at the time of capture were all identified as chub, and later positively identified) collected including fish that escaped during measurements or fish that were recaptured at the same site. Numbers elsewhere in this document may differ since those that escaped or were captured more than once may not be included in other analyses (i.e., length frequency histograms).

Method	Pass	Number of chub	Effort (hours)	Mean CPUE (fish/hour)
Trammel Net	1	61	1045.07	0.058
	2	44	982.80	0.045
	3	70	864.04	0.081
	4	24	397.23	0.060
	1-4	199	3289.14	0.061
Electrofishing	1	6	10.48	0.573
	2	5	5.44	0.919
	3	1	.45	2.222
	1-3	12	16.37	0.733
Fyke Net	1	3	261.20	0.012
	2	2	235.00	0.009
	3	4	233.14	0.017
	1-3	9	729.37	0.012
Total (incl. all methods)	1-4	220	4034.88	0.055

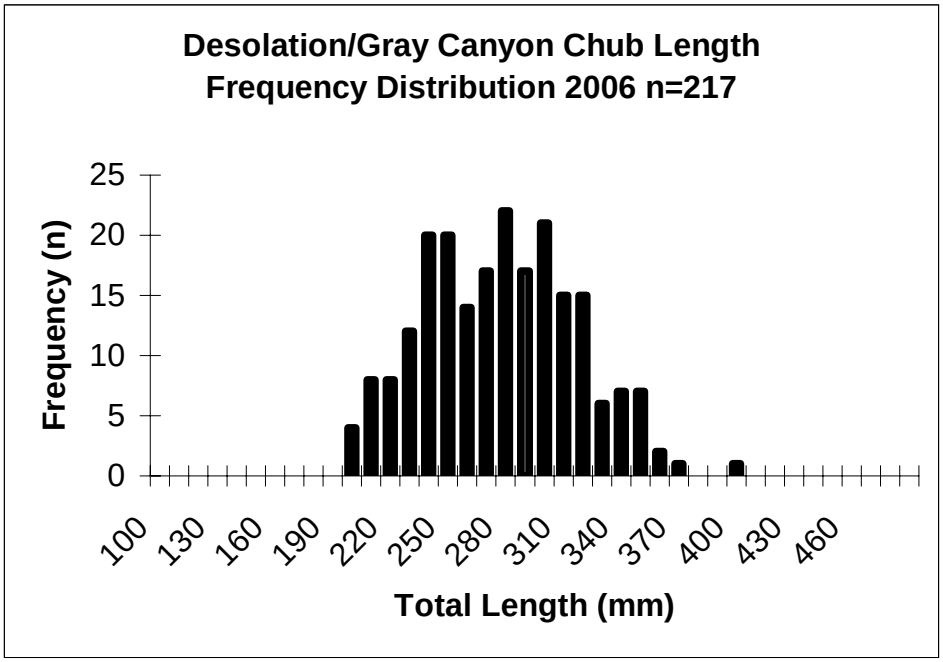

Figure 1. Desolation/Gray Canyon humpback chub length frequency histogram for 2006. Individuals less than 150 mm TL are not included. Frequency is illustrated as the number of total individuals within a given size class.

VII. Recommendations:

- Fall sampling for this population estimate should continue in FY2007. Sampling should be conducted around the middle of October or when water temperatures are around 10 ^{o}C to reduce stress on fish collected. Additionally, by catch of potentially spawning Colorado pikeminnow should be less at this time of year in Desolation and Gray canyons.

- Conducting a complete fourth sampling trip should be revisited. Lower catch rates during Fall 2006 relative to the previous three sampling trips warrants more intensive sampling. A more accurate population estimate is possible with additional effort. Of course, the budget would need to be adjusted accordingly.

- Fyke net and electroshocking sampling should continue in an effort to increase overall captures and target smaller sized chubs. Given the other recovery program work on Desolation/Gray canyon, impact on other native fish should be factored in.

VIII. Project Status: On track and ongoing

First year of three for project completed.

IX. FY 2006 Budget Status:

A. Funds provided:	$102,400
B. Funds expended:	$ 81,920
C. Difference:	$ 20,480
D. Percent FY2006 work completed: 80%	
E. Recovery Program funds spent for publication charges:	$ 0

10. Status of data submission:

Data will be entered on the computer and transferred to USFWS by January 15, 2007.

XI. Signed: *Patrick L. Goddard* Date: 11/25/2006